

Catalog 580-8

# Destiny<sup>®</sup> Indoor Air Handler Models 002 – 030



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# Certification

#### AHRI Certification



Agency Listed

CEDUS

All standard units All Canadian units

Standard size units certified

in accordance with the central station air handling units

certification program, which is

based on AHRI Standard 430.



#### 🖄 WARNING

Improper smoke or fume air handling can result in severe personal injury or death.

A registered professional engineer must design and approve the air conditioner and air handler application to make sure smoke and fume control meet local fire codes and NFPA requirements for the specific building application. Due to the wide variation in building design and ambient operating conditions into which our products can be applied, we do not represent or warrant that our products will be fit and sufficient for smoke and fume control and management purposes. The owner and building designer must consult a registered professional engineer to satisfy themselves in this regard.

# **Horizontal and Vertical Configurations**





Vertical Configuration

#### **Horizontal Configuration**

#### 1 Motor Options

- Adjustable motor mount simplifies belt tightening
- Drive side is field interchangeable to avoid clearance restrictions
- Voltage choices
- Motor power connection through external junction box
- Standard, high, and premium efficiency options
- VFD, starter, and disconnect motor control options

#### 2 FC Centrifugal Blower

- Minimum turbulence for quiet, efficient operation
- Allows higher static pressure operation than blower coil for flexible ducting and unit placement (up to 3" wg total)
- Flex collar at discharge minimizes vibration transmission
- Flexible, end or top discharge arrangements

#### Anti-Microbial Coated Galvanized or Optional Stainless Steel, Sloped Drain Pan

- Eliminates standing water to inhibit microbial growth
- Drain connections on both sides to avoid clearance restrictions
- Standard secondary drain connection
- 4 Aluminum Frame and PolymericCorners
  - Provide rigidity to structure and maximum corrosion resistance
  - Unique frame structure simplifies
     hanger bracket attachment

# Internally Isolated Fan and Motor

- Minimizes vibration transmission for quiet operation
- Rubber in shear (sizes 002 to 010)
- Spring isolators (sizes 015 and larger)

#### Double-Wall Construction with Foam-InjectedInsulation

- Eliminates insulation fibers from air stream
- Helps prevent dust buildup and provides wipe-clean surface
- Optional Galvalume<sup>®</sup> steel
   panels provide superior corrosion
   resistance
- Choice of casing materials available (special options)

#### 7 Flexible Coil and Filter Options

- Allow you to match application requirements
- Universal-hand coils are field interchangeable to avoid clearance restrictions
- Preheat and reheat arrangements available
- Flat or angular filters
- MERV-8, 2" and 4" standard
- Optional high efficiency 4" minipleats (MERV-11 through MERV-15)





Pocket Pull Access Panel



Hinged Tool Access Panel with Quarter-Turn Handle





**Bottom Access Filter Panel** 









#### Access Panels on Both Sides of Each Section

- Provide complete easy access to the unit interior
- Pocket pull handles to simplify removal and handling of access panels
- Optional hinged and quarter-turn latched access doors.
- Optional bottom filter access for horizontal units

#### Mixing Box Sections

- Provide superior mixing of return and outside air streams in ducted return applications
- Optional factory mounted actuator and damper linkage to reduce field labor

#### **10** Starter/Disconnects

- · Factory mounted and wired
- Disconnect only option: fused or non-fused
- Full control box options: fused disconnect, motor starter, and 24V transformer
- Software selectable
- · Wiring diagrams generated

#### 1 Electric Heat Section (Sizes 002 - 010)

- Single point power connection for supply fan motor and heater
- 1.5 kW 55 kW
- 1, 2, 3, or 4 steps (1 and 2 steps on size 002)
- SCR control option (available)
- Software-generated wiring diagrams
- Factory wired contactors and fuses per step
- Factory wired motor contactors or starter and fuses as applicable
- · Non-fused disconnect switch
- 24 volt control transformer
- Complete with overload and thermal protection
- High quality alloy nichrome wire (80% Ni and 20% Cr)
- Horizontal and vertical air flow arrangements
- Control box with tool access hinged door

#### Direct Drive Plenum Fan

- Higher static applications (up to 4" wg total)
- Multiple discharge directions
- Better static efficiency and less noise than a forward curved fan
- No belt maintenance and drive loss typically associated with a belt driven forward curved fan
- Variable Frequency Drive (VFD)
  - · Factory mounted and wired
  - Daikin MD4 or MD5
  - · Fused disconnect required
  - · No bypass

# The Destiny Advantage

The Daikin Destiny air handler is a full featured, light air handler that provides a single, economical solution for blower coil and low pressure air handler applications from 600 to 15,000 cfm. Destiny air handlers include many features that make it a superior choice over blower coils and other low pressure air handlers, including:

- Double-wall construction with foam injected insulation for durable construction, easy cleaning and superior IAQ
- Internally isolated FC fan and motor assembly with a flex collar on the fan discharge for low vibration and quieter operation
- Plenum fan option for higher efficiency and less noise than FC fans
- AHRI Certified performance
- Higher operating static pressures than blower coils for greater flexibility in ducting and placement
- Easy maintenance and service access on both sides
- · Factory-installed motor control devices

## Flexibility

The Daikin Destiny air handler is available in horizontal and vertical configurations with chilled water or direct expansion (DX) cooling, and hot water, or electric heat. Units can be floor mounted or ceiling hung. The coil section is field-interchangeable, allowing the unit to be piped from either side to help avoid obstructions, conserve space and simplify installation. Drain connections on both ends of the drain pan further support this flexibility.

## **Indoor Air Quality**

The Daikin Destiny air handler is designed to provide superior indoor air quality in support of ASHRAE Standard 62.1-2001 and a quiet indoor environment.

# **Unit Construction**

#### **Coil Selections**

Coil selections include:

- · Chilled water with 4 or 6 rows and 12 fins per inch
- · Direct expansion with 4 or 6 rows and 12 fins per inch
- R22, R407C, R410A, or R134a refrigerant
- · Hot water with 1 or 2 rows and 12 fins per inch
- Special (interlaced DX and non-distributing steam) coils are available on request
- Copper fins and special protective coating available

All coils are built with copper tubing and sine-wave aluminum fins mounted in a galvanized or optional stainless steel casing.

### Filter Selections

Filter selections include:

- 2" or 4" flat filters (MERV-8, or 11 through 15)
- 2" angular filters (MERV-8)

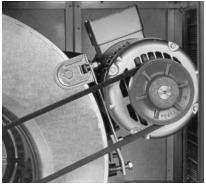
#### Motors

Motors are open drip proof (ODP) for FC and plenum fans, in sizes ranging from 1/3 to 20 horsepower and a wide range of voltages. Motors are mounted to the blower frame on an adjustable base for easy alignment and belt tensioning (Figure 1).

Premium efficiency ODP and TEFC motors are available for FC fans. Premium efficiency ODP are standard for plenum fans.

Factory motor wiring is available through an external junction box.

#### Figure 1: Adjustable Motor Mount and Pulley



# **Mixing Section Option**

Optional mixing section with low leak dampers (Figure 2) is available for applications where return and fresh air are delivered directly to the unit.

An optional factory-mounted actuator and damper linkage is available.

#### Figure 2: Mixing Section Options with Dampers





# Variable Frequency Drive (VFD)

A VFD provides adjustable speed control of a single fan motor. Factory mounted outside the fan door (Figure 3), the VFD provides a lower cost than field installation.

A fast-blow fused disconnect (supplied by Daikin or provided by others) is required upstream of the drive.

Figure 3: Variable Frequency Drive



### **Electric Heat Option**

An optional electric heat section (Figure 4, sizes 002 - 010) is available at the discharge end of the Destiny air handler to provide reheat in a horizontal or upblast vertical arrangement.

The electric heat section includes heating coils in a galvanized steel enclosure, a control box with motor starter, fused disconnect, and a 24 volt control transformer that is factory wired for single-point power connection for the heater and fan motor. Staging options are standard. An SCR controller is available as a selectable option

#### Figure 4: Electric Heat Option



### **Double-Wall Construction**

Units feature solid double-wall panel construction with foam injected polyurethane insulation, and a mechanically assembled extruded aluminum frame with polymeric corner protectors. The design provides superior rigidity to the structure as well as a smooth interior surface that promotes easy cleaning. Panels are constructed of G60 galvanized steel or optional Galvalume<sup>™</sup> steel for superior corrosion resistance.

The foam injected polyurethane insulation used in Destiny panels provides a more effective thermal barrier than 1" fiberglass insulation and eliminates concerns over insulation fibers eroding into the air stream.

## **Sloped Drain Pan**

#### Anti-Microbial Coated Galvanized Steel

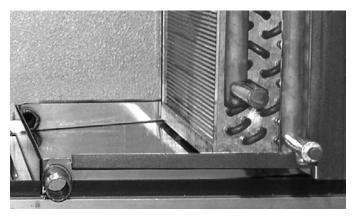
Destiny air handlers are equipped with a standard antimicrobial coated galvanized or optional stainless steel drain pan that is sloped to promote complete drainage (Figure 5).

#### **Stainless Steel Option**

The stainless steel option provides an easy, wipe-clean surface that encourages regular cleaning to help prevent microbial growth.

Drain connections on either side of the unit give installers flexibility to make proper connections around obstructions without additional field labor. A secondary drain connection is standard on the right-hand side of a unit.

#### Figure 5: Anti-Microbial Coated Galvanized Steel or Optional Stainless Steel Sloped Drain Pan





## **Cabinets and Service Access**

The cabinet interior and components are easily accessed by removing the screws holding the double wall panels in place. Unique pocket pull handles are included in alternate sections to provide sufficient grip to easily remove the panel. Optional tool access hinged doors provide access without having to remove screws.

An optional bottom filter access door (Figure 6) provides easy ceiling-mounted unit filter service.

#### Figure 6: Bottom Filter Access Door



### **Quiet Blower and Motor Assembly**

Destiny air handlers are equipped with a high efficiency double width, double inlet (DWDI) centrifugal blower that maximizes efficiency while minimizing turbulence and operating sound levels. The blower shaft is solid steel with self-aligning ball bearings that are designed for 200,000 hours of operation.

Horizontal Destiny air handlers may also be equipped with high-efficiency, prebalanced direct driven Single Width, Single Inlet (SWSI) plenum fans that will provide better efficiency and sound levels compared to FC centrifugal blowers.

The fan and motor are isolated from the unit frame using rubber in shear isolators (010 and smaller) and spring isolators (sizes 015 and larger) to help minimize vibration and provide quiet operation. A tarpaulin cloth "flex collar" between the fan housing and discharge helps to further minimize vibration and operating sound levels.

### Filter Gauge

Dwyer Megahelic<sup>™</sup> 2000 differential pressure gauge may be factory installed. The gauge range is 0–2" w.c. Two installation options are offered: flush with the panel or in a box on top of the panel.

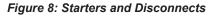
#### Figure 7: Differential Pressure Gauge



### **Starters and Disconnects**

A factory-mounted wired control box (Figure 8) with disconnect-only option (fused or non-fused) or starter/ disconnect option significantly reduces field labor, cost of construction, and start-up.

A NEMA 1 enclosure with tooled access is factory mounted on the unit bulkhead panel next to the fan discharge. Other locations are available upon request.





#### **Option Summary**

- Hinged access panels and latches for filter and fan sections, including bottom
- 2" or 4" flat filters MERV8, 11, 14, or 15
- 2" angular filters MERV8
- External prefilter 2" thick MERV8 (special option)
- Base rail 4" high (special option)
- Interlaced DX coil for all unit sizes (special option)
- · Filter gauge
- · Premium efficiency and TEFC motors
- · Mixing boxes with dampers, damper actuator and linkage
- · Electric heat section (horizontal and vertical flow)
- · Step or SCR controller on electric heater
- · Galvanized or stainless steel coil casings
- · Bottom filter access for horizontal units
- · Motor wiring through external junction box
- · Factory-mounted VFD, starter, and/or disconnect
- Painted steel exterior (special option) or stainless steel liner interior (special option)
- Non-distributing (type SS) steam coils (special option)
- Modular design for vertical units (special option)
- · Light and GEF outlet in fan section

NOTE: Please contact Daikin for all special option pricing.

# Mounting and Access

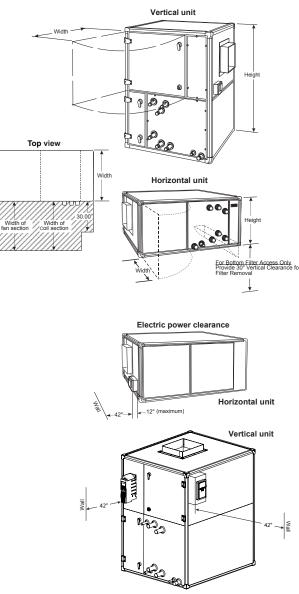
DAIKIN

Whether units are floor or ceiling mounted, take care to keep the supporting structure level and rigid enough for satisfactory unit operation. Ideally, a heavy concrete slab should be used for floor mounted units and main support beams for ceiling supported hung units. Trapeze ceiling suspended units from field-supplied materials. Avoid long floor or ceiling spans.

Locate units to provide proper access for routine service (Figure 9). Clearance for filter removal on both sides of the filter section is usually necessary. Provide clearance as required for access panels. Allow room for coil removal. Cooling units require clearance for a trap in the drain pan line.

Access to the interior of the Destiny air handler is provided by hinged access doors or removable panels.

#### Figure 9: Vertical and Horizontal Unit Access and Clearances



# **Ductwork**

Good ductwork layout minimizes system resistance and sound generation. Duct connections to and from units should allow straight, smooth airflow. Avoid sharp turns in the fan discharge, particularly turns opposed to wheel rotation. Use turning vanes. Avoid discharge plenums or any abrupt change in duct size. For units with electric heat, 20" of straight duct at the outlet of the heater is required as a minimum. See Figure 10 for good fan outlet practices.

#### Figure 10: Discharge Duct Layout

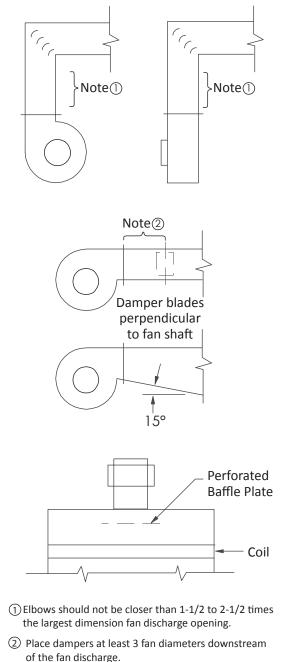


Figure reprinted with permission from the 1979 ASHRAE Guide and Data Book (Equipment).

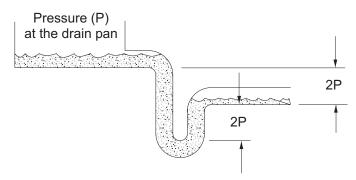


# **Piping and Drain Pan Traps**

When installing piping and drain pan traps:

- Install piping in accordance with accepted industry standards.
- Do not apply undue stress at the connection to coil headers.
- Support pipe work independently of the coils with adequate piping flexibility for thermal expansion.
- Run drain lines and traps full size from the drain pan connection.
- Drain pans should have traps to permit the condensate from the coils to drain freely.
- On a draw-through unit, the trap depth and the distance between the trap outlet and drain pan outlet should be twice the negative static pressure under normal unit operation (Figure 11).
- A secondary drain connection on the drain pan is standard on all Destiny units. Secondary drain connections are required in some application as a visual means of identifying clogged primary drain lines.

#### Figure 11: Drain Pan Traps



# Vibration Isolation

To help keep noise and vibration compatible with the intended use of the conditioned air space, apply good acoustical and vibration engineering practices during the early stages of design.

Since most applications require vibration isolation, the Destiny air handler is available with factory-installed internal isolation. Internally isolated units feature spring or rubber in shear isolators sized specifically for each fan wheel and unit size.

# Sound

The unit inlet, outlet, and radiated sound levels for each octave band, based on your specific application, are calculated by the Daikin SelectTools<sup>™</sup> Software. Sound performance data is derived from testing performed in accordance with the AMCA Standard 300. The effects of various components, casework, and unit configurations have been taken into account.

# Air Supply Systems and Fan Laws

An air supply system consists of an air handler cabinet, heat exchanger, filters, ductwork, grilles and registers used to distribute air throughout the building. The system is independent of the fan used to supply the system.

The resistance of the system, referred to as static pressure (SP), is dependent upon the quantity of air (cfm) that is moved through it. The air quantity is determined by the cooling, heating and ventilating requirements.

For any system, the static pressure varies directly as the square of the air quantity. This relationship between cfm and SP establishes the system curve for that system and can be expressed as follows:

$$\left(\frac{\text{cfm}_1}{\text{cfm}_2}\right)^2 = \frac{\text{SP}_1}{\text{SP}_2} \text{ or } \text{SP}_2 = \text{SP}_1\left(\frac{\text{cfm}_1}{\text{cfm}_2}\right)^2$$

The system curve is unique for a particular system configuration. Any change to the system caused by dirty filters, damper changes, etc. results in a new system curve.

For fans operating at low pressures (less than 10" W.G.), the effects of air compression are negligible. Disregarding air compression allows fan operation in a fixed system to be expressed by simple relationships. These relationships are known as fan laws and can be used to calculate the effects of fan speed and air density changes on this system.

1. The flow rate varies directly with the change in fan speed:

$$\frac{cfm_1}{cfm_2} = \frac{rpm_1}{rpm_2} \text{ or } cfm_2 = cfm_1\left(\frac{rpm_1}{rpm_2}\right)$$

A 10% increase in fan speed increases air quantity 10%.

2. The static pressure varies as the square of the change in fan speed:

$$\frac{SP_1}{SP_2} = \left(\frac{rpm_1}{rpm_2}\right)^2 \text{ or } SP_2 = SP_1 \left(\frac{rpm_2}{rpm_1}\right)^2$$

A 10% increase in fan speed increases static pressure 21%.

3. The fan brake horsepower varies as the cube of the change in fan speed:

$$\frac{hp_1}{hp_2} = \left(\frac{rpm_1}{rpm_2}\right)^3 \text{ or } hp_2 = hp_1 \left(\frac{rpm_2}{rpm_1}\right)^3$$

A 10% increase in fan speed increases fan horsepower 33%.



4. System static pressure and brake horsepower are directly proportional to the air density:

$$SP_{2} = SP_{1} \left(\frac{\text{density}_{2}}{\text{density}_{1}}\right) \left(\frac{\text{rpm}_{2}}{\text{rpm}_{1}}\right)^{2}$$
$$SP_{2} = SP_{1} \left(\frac{\text{density}_{2}}{\text{density}_{1}}\right) \left(\frac{\text{rpm}_{2}}{\text{rpm}_{1}}\right)^{3}$$

Consequently, the static pressure and brake horsepower decrease with an increase in air temperature or higher altitude, and increase with a decrease in air temperature or lower altitude.

To determine fan performance for temperatures and altitudes other than standard (70°F, 0 ft. altitude), adjust the static pressure by the density ratio before determining the fan rpm and bhp requirements. Density ratios are expressed as temperature and altitude conversion factors in Table 1.

Table 1: Temperature an	d Altitude Conversion	Factors
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Air				Alt	itude (fe	et)			
temp. (°F)	0	1000	2000	3000	4000	5000	6000	7000	8000
-20	1.20	1.16	1.12	1.08	1.04	1.00	0.97	0.93	0.89
0	1.15	1.10	1.08	1.02	0.99	0.95	0.92	0.88	0.85
20	1.11	1.06	1.02	0.98	0.95	0.92	0.88	0.85	0.82
40	1.06	1.02	0.98	0.94	0.91	0.88	0.84	0.81	0.78
60	1.02	0.98	0.94	0.91	0.88	0.85	0.81	0.79	0.76
70	1.00	0.96	0.93	0.89	0.86	0.83	0.80	0.77	0.74
80	0.98	0.94	0.91	0.88	0.84	0.81	0.78	0.75	0.72
100	0.94	0.91	0.88	0.84	0.81	0.78	0.75	0.72	0.70
120	0.92	0.88	0.85	0.81	0.78	0.76	0.72	0.70	0.67
140	0.89	0.85	0.82	0.79	0.76	0.73	0.70	0.68	0.65
160	0.85	0.82	0.79	0.76	0.74	0.70	0.68	0.65	0.63
200	0.80	0.77	0.75	0.72	0.69	0.67	0.64	0.62	0.60
250	0.75	0.72	0.69	0.67	0.65	0.62	0.60	0.58	0.56

Table 2: Estimated Capacity Range for Destiny Cooling Coils

Unit Size	Capacity Range, tons*
002	1.0–3.0
003	2.0-6.0
004	2.5–7.0
005	3.5–10.0
007	5.0–14.0
010	7.0–18.0
015	10.0–28.0
020	14.0–38.0
025	17.0–47.0
030	20.0–55.0

\* Values are given for reference only. Actual unit capacity must be verified with the Daikin Tools™ selection software.

# Fan and Motor Heat

Motor and drive heat—The total energy input to any fan motor is consumed in two ways: by heat dissipated through the motor frame and by work output. The amount of heat dissipated by the motor is a function of its operating efficiency:

#### Motor heat = input $\times$ (1 – motor efficiency)

A small amount of the motor work output is dissipated by the drive mechanism, which also results in a heat gain. Belt drive losses are a function of belt tension and number of belts as well as power transmitted. Typical belt drive losses range from 2% to 6% of bhp.

Whether motor and drive heat gain become part of an air handling system cooling load depends on the motor location relative to the conditioned space. For air handlers with internal motors, the motor and drive are within the conditioned space. Therefore, the motor and drive add heat to the system. Subtract this heat from the cooling capacity and add it to the heating capacity of the unit.

**Fan Heat Generation**—All of the power input to a fan results in heat gain, which must be considered as a cooling load. The amount of heat generated is directly proportional to the fan bhp:

#### Fan heat (Btuh) = bhp × 2545 / motor efficiency

Temperature rise due to motor heat-

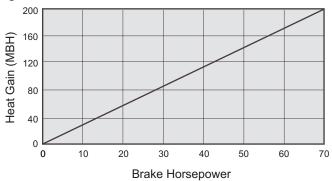
Temp. rise = 
$$\frac{fan heat (Btuh)}{air flow (cfm) \times 1.09}$$
 [°F]

Much of this heat generation occurs within the fan itself. Fans are not 100% efficient, and the energy losses that occur are converted into heat. The work done by the fan on the airstream increases the temperature, pressure, and velocity of air. The heat of compression required to raise the airstream to this increased energy level is also a heat gain.

As the air travels throughout the building, its energy is deteriorated by friction, resulting in pressure drop. This also is heat gain, but it does not result in temperature rise because the air expands as the pressure is reduced. The expansion is a cooling process that offsets the heat generated by friction.

Typical fan and motor heat values are given in Figure 12.

Figure 12: Fan and Motor Heat Gain



# **Component and Section Weights**

#### Table 3: Unit Coil Weights

Coll turns		Weight—Ibs (kg)											
Coil type	002	003	004	005	007	010	015	020	025	030			
4-row chilled water	31.64	40.56	54.30	59.19	84.80	111.99	185.93	255.08	298.34	341.54			
	(14.35)	(18.40)	(24.64)	(26.85)	(38.46)	(50.80)	(84.34)	(115.70)	(135.32)	(154.92)			
6-row chilled water	39.94	54.81	69.01	86.91	112.30	154.05	261.55	353.14	416.35	477.93			
	(18.12)	(24.86)	(31.30)	(39.42)	(50.94)	(69.88)	(118.64)	(160.18)	(188.85)	(216.79)			
1-row hot water	16.11	19.95	28.36	33.60	45.86	66.07	91.35	116.29	132.03	168.86			
	(7.31)	(9.05)	(12.86)	(15.24)	(20.80)	(29.97)	(41.44)	(52.75)	(59.89)	(76.59)			
2-row hot water	24.36	29.96	38.07	46.13	64.28	83.91	121.10	171.48	197.12	223.03			
	(11.05)	(13.59)	(17.27)	(20.92)	(29.16)	(38.06)	(54.93)	(77.78)	(89.41)	(101.16)			
4-row DX	32.73	42.91	50.11	64.80	88.18	115.42	195.54	248.63	300.8	344.86			
	(14.85)	(19.46)	(22.73)	(29.39)	(40.00)	(52.35)	(88.70)	(112.78)	(136.44)	(156.43)			
6-row DX	43.37	57.01	71.53	91.69	105.18	158.52	268.37	365.31	429.85	493.24			
	(19.67)	(25.86)	(32.45)	(41.59)	(47.71)	(71.90)	(121.73)	(165.71)	(194.98)	(223.73)			

#### Table 4: Base Unit Cabinet Weights—Horizontal Unit with Forward Curved Fan

					Weight-	–lbs (kg)								
					Config	uration								
	No heat Reheat coil		No heat	Reheat coil	No heat*	Reheat coil	No heat*	Reheat coil	Prehe	at coil				
Unit size	Flat filters	Flat filters	Angular filters	Angular filters	Flat filters	Flat filters	Angular filters	Angular filters	Flat filters	Angular filters				
	Cooling coil	Cooling coil	Cooling coil	Cooling coil	N/A	N/A	N/A	N/A	Cooling coil	Cooling coil				
	Fan	Fan	Fan	Fan	Fan	Fan	Fan	Fan	Fan	Fan				
002	142.34 (64.56)		187.56 (85.08)		122.36 (55.50)		149.39 (67.76)		157.12 (71.27)	184.19 (83.55)				
003	170.89 (77.51)		213.02 (96.62)		148.04 (67.150		169.18 (76.74)		186.67 (84.67)	208.34 (94.50)				
004	207.68	(94.20)	257.99 (117.02)		182.04 (82.47)		205.76 (93.33)		233.73 (106.02)	257.55 (116.82)				
005	245.41	(111.32)	317.41 (143.98)		213.25 (96.73)		253.09 (114.80)		267.13 (121.17)	307.89 (139.66)				
007	262.71	(119.16)	340.86 (154.61)		224.74 (101.94)		271.81 (123.29)		298.53 (135.41)	346.93 (157.36)				
010	302.58	(137.25)	392.63	(178.09)	260.15 (118.00)		312.73 (141.85)		341.67 (154.98)	395.58 (179.43)				
015	359.18	(162.92)	463.09	(210.05)	352.58 (159.93)		411.89 (186.83)		419.72 (190.38)	480.74 (218.06)				
020	445.55	(202.10)	596.73	(270.67)	440.70	440.70 (199.90)		(241.77)	511.86 (232.18)	606.56 (275.13)				
025	559.02 (253.57)		559.02 (253.57) 736.09 (333.89)		736.09 (333.89) 554.95 (251.72) 658.10 (298.51)		736.09 (333.89)		554.95 (251.72)		658.10 (298.51)		616.52 (279.65)	773.96 (351.06)
030	603.25	(273.63)	817.52	(370.82)	599.00	(271.70)	730.10	(331.17)	633.19 (287.21)	830.10 (376.53)				

Note: \*Ventilation only

#### Table 5: Base Unit Cabinet Weights—Horizontal Unit with Plenum Fan

					Weight-	-lbs (kg)				
					Config	uration				
	No heat	Reheat coil	No heat	Reheat coil	No heat*	Reheat coil	No heat*	Reheat coil	Prehe	at coil
Unit size	Flat filters	Flat filters	Angular filters	Angular filters	Flat filters	Flat filters	Angular filters	Angular filters	Flat filters	Angular filters
	Cooling coil	Cooling coil	Cooling coil	Cooling coil	N/A	N/A	N/A	N/A	Cooling coil	Cooling coil
	Fan	Fan	Fan	Fan	Fan	Fan	Fan	Fan	Fan	Fan
002	126	(57)	125 (57)		102 (46)		105 (47)		129 (59)	128 (58)
003	140	(63)	161 (73)		131 (59)		151 (69)		168 (76)	173 (78)
004	220	(100)	214 (97)		193 (88)		193 (88)		225 (102)	252 (114)
005	186	(84)	231 (105)		175 (79)		202 (92)		216 (98)	237 (107)
007	285	(129)	315 (143)		224 (102)		267 (121)		304 (138)	349 (158)
010	309	(140)	395	(179)	270 (122)		316 (143)		392 (178)	454 (206)
015	561	(254)	600	(272)	545	545 (247)		(264)	626 (284)	674 (306)
020	663 (	(301)	708 (321)		679	679 (308)		692 (314)		774 (351)
025	743	(337)	740 (335)		698 (317)		845 (383)		767 (348)	788 (357)
030	770	(349)	947	(430)	749 (340)		894 (406)		929 (421)	941 (427)

Note: \*Ventilation only

#### Table 6: Base Unit Cabinet Weights—Vertical Unit

		Weight-	–lbs (kg)				
		Config	juration				
Unit size	No heat	Reheat coil	No heat*	Reheat coil			
Unit size	Flat filters	Flat filters	Flat filters	Flat filters			
	Cooling coil	Cooling coil	N/A	N/A			
	Fan	Fan	Fan	Fan			
002	134.70	(61.10)	134.70 (61.10)				
003	183.20	(83.10)	183.20 (83.10)				
004	209.79	(95.16)	209.79 (95.16)				
005	239.00	(108.40)	239.00 (108.40)				
007	349.08	(158.30)	349.08 (158.30)				
010	399.23	(181.09)	399.23	(181.09)			
015	484.20	(219.63)	484.20	(219.63)			
020	566.96	(257.17)	566.96 (257.17)				
025	725.28	(328.98)	725.28 (328.98)				
030	750.14	(340.26)	750.14 (340.26)				

Note: \*Ventilation only

#### Table 7: Electric Heat Weights

Unit size	Weight—Ibs (kg)										
Unit Size	1 Step	2 Steps	3 Steps	4 Steps							
002	31 (14.00)	35 (16.00)	—	_							
003	32 (14.50)	36 (16.50)	41 (18.50)	45 (20.50)							
004	32 (14.50)	36 (16.50)	41 (18.50)	45 (20.50)							
005	34 (15.50)	39 (17.50)	43 (19.50)	47 (21.50)							
007	36 (16.50)	41 (18.50)	45 (20.50)	50 (22.50)							
010	36 (16.50)	41 (18.50)	45 (20.50)	50 (22.50)							



#### Table 8: Motor Weights\*\*\*

						Fan m	otor size –	horsepow	er (hp)				
Unit size	Motor	0.33	0.5	0.75	1.0	1.5	2.0	3.0	5.0	7.5	10.0	15.0	20.0
	Max. weight, lb (kg)	25 (11.33)	27 (12.25)	27 (12.25)	40 (18.41)	44 (19.96)	46 (20.87)	_	_	_	_	_	_
002	Frame size	56	56	56	*	**	145T	—	—	—	—	—	—
	Shaft dia. in	5/8	5/8	5/8	*	*	7/8	—	—	—	—	—	—
	Max. weight, lb (kg)	25 (11.33)	27 (12.25)	27 (12.25)	40 (18.41)	44 (19.96)	46 (20.87)	69 (31.30)	85 (38.55)	_	—	_	_
003	Frame size	56	56	56	*	**	145T	182T	184T	_	—	_	—
	Shaft dia. in	5/8	5/8	5/8	*	**	7/8	1-1/8	1-1/8	—	—	—	—
004	Max. weight, lb (kg)	25 (11.33)	27 (12.25)	27 (12.25)	40 (18.41)	44 (19.96)	46 (20.87)	69 (31.30)	85 (38.55)	—	—	_	—
004	Frame size	56	56	56	*	**	145T	182T	184T	_	—	_	—
	Shaft dia. in	5/8	5/8	5/8	*	**	7/8	1-1/8	1-1/8	—	—	_	—
	Max. weight, lb (kg)	—	—	27 (12.25)	40 (18.41)	44 (19.96)	46 (20.87)	69 (31.30)	85 (38.55)	_	—	_	_
005	Frame size	_	—	56	*	**	145T	182T	184T	—	_	_	—
	Shaft dia. in	_	—	5/8	*	**	7/8	1-1/8	1-1/8	—	_	_	—
	Max. weight, lb (kg)	—	—	—	40 (18.41)	44 (19.96)	46 (20.87)	69 (31.30)	85 (38.55)	129 (58.51)	—	—	_
007	Frame size	—	—	—	*	**	145T	182T	184T	213T	—	—	—
	Shaft dia. in	—	—	—	*	**	7/8	1-1/8	1-1/8	1-3/8	—	—	—
	Max. weight, lb (kg)	—	—	_	40 (18.41)	44 (19.96)	46 (20.87)	69 (31.30)	85 (38.55)	129 (58.51)	—	_	—
010	Frame size	—	—	—	*	**	145T	182T	184T	213T	—	—	—
	Shaft dia. in	—	—	—	*	**	7/8	1-1/8	1-1/8	1-3/8	—	—	—
	Max. weight, lb (kg)	—	—	—	—	44 (19.96)	46 (20.87)	69 (31.30)	85 (38.55)	129 (58.51)	129 (58.51)	217 (98.43)	—
015	Frame size	—	—	—	—	143T	145T	182T	184T	213T	215T	254T	—
	Shaft dia. in	—	—	—	—	7/8	7/8	1-1/8	1-1/8	1-3/8	1-3/8	1-5/8	—
	Max. weight, lb (kg)	_	—	_	_	46 (20.87)	69 (31.30)	85 (38.55)	129 (58.51)	129 (58.51)	217 (98.43)	_	
020	Frame size	—	—	—	—	145T	182T	184T	213T	215T	254T	—	
	Shaft dia. in	—	—	—	—	7/8	1-1/8	1-1/8	1-3/8	1-3/8	1-5/8	—	
	Max. weight, lb (kg)	—	—	—	—	—	—	—	85 (38.55)	129 (58.51)	129 (58.51)	217 (98.43)	259 (117.48)
025	Frame size	—	—	—	—	—	—	—	184T	213T	215T	254T	256T
	Shaft dia. in	—	—		—	—	—	—	1-1/8	1-3/8	1-3/8	1-5/8	1-5/8
	Max. weight, lb (kg)								85 (38.55)	129 (58.51)	129 (58.51)	217 (98.43)	259 (117.48)
030	Frame size	_	—		—	_	—		184T	213T	215T	254T	256T
	Shaft dia. in	—	—		—	—	—	_	1-1/8	1-3/8	1-3/8	1-5/8	1-5/8

Note: \* 56/56H frame and 5/8" shaft diameter for 1-ph motors 143T frame and 7/8" shaft diameter for 3-ph motors \*\* 56/56H frame and 5/8" shaft diameter for 1-ph motors 143T frame and 7/8" shaft diameter for 3-ph motors \*\*\* Refer to "HP range" in Table 13 on page 16 for applicable motors per unit size



#### Table 9: Coil Water Weight

Madalaiza	Number of Rows	Height	Length	Tube Dia	Coil Wate	er Weight
Model size	Number of Rows	in	in	in	lbs	gal
	1	14	21	3/8	7.5	0.94
LAH002	2	14	21	3/8	13.1	1.63
LAHUUZ	4	14	21	3/8	15.4	1.93
	6	14	21	3/8	lbs 7.5 13.1	2.23
	1	16	27	3/8	9.0	1.12
LAH003	2	16	27	3/8	15.7	1.96
LAHUUS	4	16	27	3/8	25.4	3.17
	6	16	27	3/8	28.7	3.59
	1	16	34	3/8	14.4	1.79
LAH004	2	16	34	3/8	22.7	2.84
LAH004	4	16	34	3/8	53.7	6.71
	6	16	34	3/8	57.8	7.23
	1	22	34	3/8	19.9	2.49
LAH005	2	22	34	3/8	31.6	3.95
LAHUUS	4	22	34	3/8	74.5	9.32
	6	22	34	3/8	80.2	10.03
	1	22	48	3/8	29.8	3.72
	2	22	48	3/8	70.9	8.87
LAH007	4	22	48	3/8	78.8	9.85
	6	22	48	3/8	57.8           19.9           31.6           74.5           80.2           29.8           70.9           78.8           86.6           50.2           88.3           98.7           150.9           66.0           117.2	10.83
	1	26	54	3/8	50.2	6.28
LAH010	2	26	54	3/8	88.3	11.04
LAHUTU	4	26	54	3/8	98.7	12.33
	6	26	54	3/8	150.9	18.86
	1	32.5	65	1/2	66.0	8.25
LAH015	2	32.5	65	1/2	117.2	14.65
LAHUTS	4	32.5	65	1/2	139.5	17.44
	6	32.5	65	1/2	212.7	26.59
	1	45	65	1/2	145.7	18.21
LAH020	2	45	65	1/2	231.1	28.88
LAHUZU	4	45	65	1/2	346.9	43.36
	6	45	65	1/2	377.6	47.20
	1	45	80	1/2	149.0	18.63
LAH025	2	45	80	1/2	237.8	29.72
LAHUZU	4	45	80	1/2	360.3	45.03
	6	45	80	1/2	397.7	49.71
	1	52.5	80	1/2	268.5	33.56
LAH030	2	52.5	80	1/2	290.4	36.30
LAHUJU	4	52.5	80	1/2	438.8	54.85
	6	52.5	80	1/2	482.4	60.30



#### Table 10: Filter Sizes and Quantities

Filter data Flat filter bank number Flat filter (qty) size Flat filter depth options		Unit size													
Filter data	002	003	004	005	007	010	015	020	025	030					
				Fla	at filters										
	1	1	1	1	1	1	2	2	2	2					
	(1) 16 × 25	(1) 18 × 24	(2) 16 × 20	(2) 20 × 24	(2) 24 × 24	(3) 20 × 25	(3) 12 × 24 (3) 24 × 24	(6) 24 × 24	(4) 20 × 24 (4) 24 × 24	(6) 16 × 25 (4) 20 × 25					
	2", 4"	2", 4"	2", 4"	2", 4"	2", 4"	2", 4"	2", 4"	2", 4"	2", 4"	2", 4"					
				Ang	ular filters										
Angular filter bank number	1	1	1	2	2	2	2	3	3	3					
Angular filter (qty) size	(1) 20 × 24	(2) 16 × 20	(2) 20 × 20	(4) 16 × 20	(4) 16 × 25	(6) 16 × 20	(6) 20 × 24	(9) 20 × 24	(6) 20 × 24 (6) 24 × 24	(6) 20 × 24 (6) 24 × 24					
Angular filter depth options	2"	2"	2"	2"	2"	2"	2"	2"	2"	2"					

#### Table 11: Dran Pan Connections

Standard and optional					Unit	size				
stainless steel	002	003	004	005	007	010	015	020	025	030
Arrangement	Sloped	Sloped	Sloped	Sloped						
Connection size - Main	1" ID MPT	1-1/4" ID MPT	1-1/4" ID MPT	1-1/4" ID MPT	1-1/4" ID MPT					
Connection size- Secondary	1/2" ID MPT	1/2" ID MPT	1/2" ID MPT	1/2" ID MPT						



# Fan Data

#### Table 12: Forward Curved Fan Data

Fan data					Unit	size				
Fan Gata	002	003	004	005	007	010	015	020	025	030
Fan type	DWDI FC	DWDI FC	DWDI FC	DWDI FC	DWDI FC	DWDI FC	Twin DWDI FC	Twin DWDI FC	Twin DWDI FC	Twin DWDI FC
Diameter (in)	7/7	9/9	9/9	10/10	12/12	12/12	10/10	12/12	15/15	15/15
HP range	0.33–2	0.33–3	0.33–5	0.75–5	1–5	1–7.5	2–15	3–15	5–20	5–20
cfm minimum—fan limit	206	206	529	529	765	765	1059	1529	2118	2118
cfm maximum—fan limit	2,088	2,088	5,765	6,176	8,529	8,529	12,353	17,059	26,706	26,706
Maximum rpm	2,680	2,650	2,650	2,100	1,700	1,700	2,100	1,700	1,500	1,500
Class	1	1	1	1	1	1	1	1	1	1
Motor sheave	VP, VL, VM	VP, VL, VM	VP, VL, VM	VP, VL, VM	VP, VL, VM	VP, VL, VM	VP, VL, VM	VP, VL, VM	VP, VL, VM	VP, VL, VM
Fan sheave	AK, BK	AK, BK	AK, BK	AK, BK	AK, BK	AK, BK	AK, BK	AK, BK	AK, BK	AK, BK
Belt	A, AX, B, BX	A, AX, B, BX	A, AX, B, BX	A, AX, B, BX	A, AX, B, BX	A, AX, B, BX	A, AX, B, BX	A, AX, B, BX	A, AX, B, BX	A, AX, B, BX
Fan shaft diameter	3/4"	3/4"	3/4"	3/4"	1.0"	1.0"	3/4"	1.0"	1.0"	1.0"
Weight—Ibs (kg)	19.03 (8.63)	33.95 (15.40)	33.95 (15.40)	41.45 (18.80)	60.85 (27.60)	60.85 (27.60)	79.37 (36.00)	126.77 (57.50)	154.87 (70.25)	154.87 (70.25)

#### Table 13: Plenum Fan Data

Fan data					Unit	size				
Fan data	002	003	004	005	007	010	015	020	025	030
Fan type	SWSI DD Plenum									
Diameter (in)	9	10	11	12.5	14	16	20	22	25	25
HP range	1.5–2	1.5–5	1–5	1–5	1–7.5	1–7.5	1.5–15	2–15	5–20	5–20
cfm minimum—fan limit	100	150	200	200	250	325	525	650	800	800
cfm maximum—fan limit	1800	2650	4100	4100	5000	5200	9200	12,900	16,150	16,150
Maximum rpm	5175	5175	4245	4245	3600	2625	2265	2310	2060	2060
Weight with smallest motor—lbs (kg)	50 (22.7)	57 (25.9)	59 (26.8)	62 (28.1)	71 (32.2)	86 (39)	147 (66.7)	176 (79.8)	263 (119.3)	263 (119.3)
Weight with largest motor—lbs (kg)	56 (25.4)	84 (38.1)	86 (39)	89 (40.4)	114 (51.7)	154 (69.9)	281 (127.4)	312 (141.5)	363 (164.7)	363 (164.7)



# **Coil Data**

#### Table 14: Coil Data—Chilled Water

	Unit size													
data	002	003	004	005	007	010	015	020	025	030				
Fin height	14	16	16	22	22	26	32.5	45	45	52.5				
Fin length	21	27	34	34	48	54	65	65	80	80				
Rows	4, 6	4, 6	4, 6	4, 6	4, 6	4, 6	4, 6	4, 6	4, 6	4, 6				
FPI	12	12	12	12	12	12	12	12	12	12				
Connection material	Copper sweat	Copper sweat	Copper sweat	Copper sweat	Copper sweat	Copper sweat	Steel NPT	Steel NPT	Steel NPT	Steel NPT				
Connection size 4-row	0.875 OD	1.125 OD	1.625 OD	1.625 OD	1.625 OD	1.625 OD	1.5 NPT	2.5 NPT	2.5 NPT	2.5 NPT				
Connection size 6-row	0.875 OD	1.125 OD	1.625 OD	1.625 OD	1.625 OD	2.125 OD	2.0 NPT	2.5 NPT	2.5 NPT	2.5 NPT				
Casing	Galv./SS	Galv./SS	Galv./SS	Galv./SS	Galv./SS	Galv./SS	Galv./SS	Galv./SS	Galv./SS	Galv./SS				

#### Table 15: Coil Data—DX Coils

DV sells data					Unit	size				
DX coils data	002	003	004	005	007	010	015	020	025	030
Fin height	14	16	16	22	22	26	32.5	45	45	52.5
Fin length	21	27	34	34	48	54	65	65	80	80
Rows	4, 6	4, 6	4, 6	4, 6	4, 6	4, 6	4, 6	4, 6	4, 6	4, 6
FPI	12	12	12	12	12	12	12	12	12	12
Connection material	Copper sweat									
Suction Connection size 4-row	0.875 OD	1.125 OD	1.125 OD	1.125 OD	1.625 OD					
Liquid Connection size 4-row	0.625 OD	0.625 OD	0.625 OD	0.875 OD	0.875 OD	1.125 OD	0.625 OD	0.875 OD	1.125 OD	1.125 OD
Suction Connection size 6-row	0.875 OD	1.125 OD	1.625 OD	1.625 OD	1.625 OD	2.125 OD	1.625 OD	1.625 OD	2.125 OD	2.625 OD
Liquid Connection size 6-row	0.625 OD	0.625 OD	0.625 OD	1.125 OD	1.125 OD	1.125 OD	0.875 OD	0.875 OD	1.125 OD	1.375 OD
Casing	Galv./SS.	Galv./SS								
Number of circuits	1	1	1	1	1	1	2	2	2	2
Circuit type	Norma	Normal	Normal	Normal	Normal	Normal	Face split	Face split	Face split	Face split

#### Table 16: Coil Data—Hot Water Coils

Hot water		14         16         16         22         22         26         32.5         45         45         52.5           21         27         34         34         48         54         65         65         80         80           ,2         1,2									
coil data	002	003	004	005	007	010	015	020	025	030	
Fin height	14	16	16	22	22	26	32.5	45	45	52.5	
Fin length	21	27	34	34	48	54	65	65	80	80	
Rows	1, 2	1, 2	1, 2	1, 2	1, 2	1, 2	1, 2	1, 2	1, 2	1, 2	
FPI	12	12	12	12	12	12	12	12	12	12	
Connection material	Copper sweat						Steel NPT	Steel NPT	Steel NPT	Steel NPT	
Connection size 1-row	0.625 OD	0.625 OD	0.875 OD	0.875 OD	1.125 OD	1.375 OD	1.0 NPT	1.5 NPT	1.5 NPT	2.0 NPT	
Connection size 2-row	0.875 OD	0.875 OD	1.125 OD	1.125 OD	1.625 OD	1.625 OD	1.5 NPT	2.0 NPT	2.0 NPT	2.0 NPT	
Casing	Galv./SS	Galv./SS	Galv./SS	Galv./SS	Galv./SS	Galv./SS	Galv./SS	Galv./SS	Galv./SS	Galv./SS	



# **Electric Heat Data**

#### Table 17: Electric Heat Data for Unit Sizes

Unit Oine	Number of				Voltage/kW Range	9		
Unit Size	Stages	120/1/60	208/1/60	240/1/60	208/3/60	240/3/60	480/3/60	600/3/60
000	1	1.5–4.5	1.5–8	1.5–9	1.5–10	1.5–10	1.5–10	1.5–10
002	2	4–9	4–9	4–10	4–10	4–10	4–10	4–10
	1	2.5-4.5	2.5–8	2.5–9	2.5–13	2.5–15	2.5–20	2.5–20
003	2	4–9	4–16	4–20	4–20	4–20	4–20	4–20
003	3	10–13	15–20	15–20	15–20	15–20	15–20	15–20
	4	14–18	20	20	20	20	20	20
	1	2.5-4.5	2.5–8	2.6–9	2.5–13	2.5–15	2.5–20	2.5–20
004	2	4–9	4–16	4–18	4–20	4–20	4–20	4–20
004	3	9.5–13	15–20	15–20	15–20	15–20	15–20	15–20
	4	14–18	20	20	20	20	20	20
	1	4-4.5	4–8	4–9	4–13	4–15	4–24	4–26
005	2	4–9	4–16	4–18	4–26	4–26	4–26	4–26
005	3	10–13	15–24	15–26	15–26	15–26	15–26	15–26
	4	14–18	20–26	20–26	20–26	20–26	20–26	20–26
	1	NA	6–8	6–9	6–13	6–15	6–20	6–20
007	2	6–9	6–16	6–18	6–26	6–30	6–36	6–36
007	3	10–13	15–24	15–26	15–38	15–38	15–38	15–38
	4	14–18	20–32	20–36	20–38	20–38	20–38	20–38
	1	NA	6–8	6–9	6–13	6–13	6–19	6–19
040	2	6–9	6–16	6–18	6–26	6–30	6–36	6–36
010	3	10–13	15–24	15–26	15–40	15–45	15–55	15–55
	4	14–18	20–32	20–36	20–55	20–55	20–55	20–55

# **Cabinet Dimensions—Horizontal**

Dimer	nsion/					Unit	size				
Configu	uration	002	003	004	005	007	010	015	020	025	030
Cabinet D	imension				Unit heig	ght and width	dimensions,	in. (mm)			
Hei	ght	20.47 (520)	22.44 (570)	22.44 (570)	28.35 (720)	28.35 (720)	32.48 (825)	39.37 (1000)	51.57 (1310)	51.57 (1310)	59.06 (1500)
Wie	dth	28.54 (725)	34.84 (885)	42.52 (1080)	42.52 (1080)	56.50 (1435)	63.00 (1600)	74.41 (1890)	75.00 (1905)	89.96 (2285)	89.96 (2285)
Configu	uration				Uni	it length dime	nsions, in. (n	nm)			
Cooling only or	Flat filter	47.84 (1215)	47.84 (1215)	53.35 (1355)	54.72 (1390)	58.86 (1495)	58.86 (1495)	53.74 (1365)	56.30 (1430)	62.00 (1575)	62.00 (1575)
cooling with reheat coils	Angular filter	58.27 (1480)	55.12 (1400)	60.63 (1540)	65.95 (1675)	70.08 (1780)	70.08 (1780)	64.37 (1635)	71.26 (1810)	76.97 (1955)	80.12 (2035)
Cooling with	Flat filter	51.97 (1320)	51.97 (1320)	59.25 (15.05)	59.45 (15.10)	65.55 (1665)	65.55 (1665)	62.80 (15.95)	65.35 (1660)	69.09 (17.55)	69.09 (17.55)
preheat coils	Angular filter	62.40 (15.85)	59.25 (1505)	66.53 (1690)	70.67 (17.95)	76.77 (1950)	76.77 (1950)	73.42 (18.65)	80.32 (2040)	84.06 (2135)	87.20 (2215)
Heating	Flat filter	39.96 (1015)	39.96 (1015)	45.47 (1155)	45.67 (1160)	49.80 (1265)	49.80 (1265)	52.56 (1335)	55.51 (1410)	61.42 (1560)	61.42 (1560)
only	Angular filter	50.39 (1280)	47.24 (1200)	52.76 (1340)	56.89 (1445)	61.02 (1550)	61.02 (1550)	63.19 (1605)	70.47 (1790)	76.38 (1940)	79.53 (2020)
Ventilation	Flat filter	39.96 (1015)	39.96 (1015)	45.47 (1155)	45.67 (1160)	49.80 (1265)	49.80 (1265)	52.56 (1335)	55.51 (1410)	61.42 (1560)	61.42 (1560)
only	Angular filter	50.39 (1280)	47.24 (1200)	52.76 (1340)	56.89 (1445)	61.02 (1550)	61.02 (1550)	63.19 (1605)	70.47 (1790)	76.38 (1940)	79.53 (2020)
Discharge Dimer					Discharge I	neight and wi	dth dimensio	ns, in. (mm)			
Hei	ght	9.17 (233)	11.77 (299)	11.77 (299)	13.07 (332)	15.51 (394)	15.51 (394)	2 × 13.07* (332)	2 × 15.51* (394)	2 × 18.54* (471)	2 × 18.54* (471)
Wie	dth	8.74 (222)	10.20 (259)	10.20 (259)	11.34 (288)	13.46 (342)	13.46 (342)	2 × 11.34* (288)	2 × 13.46* (342)	2 × 15.83* (402)	2 × 15.83* (402)

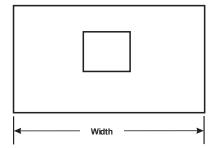
#### Table 18: Cabinet Dimensions—Horizontal Unit with Forward Curved Fan

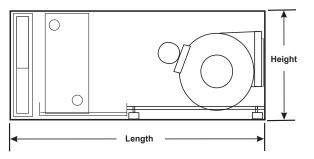
Note: \* Twin openings

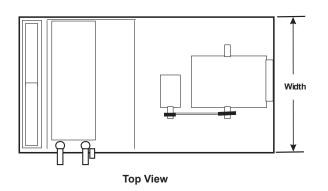
#### Figure 13: Horizontal Unit (with Forward Curved Fan) Dimensions

Front View

#### Side View



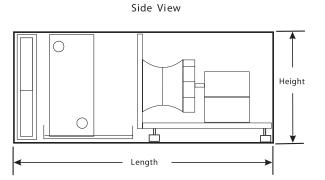


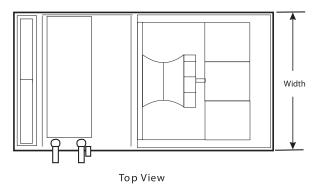


Dimension/Ocmfi						Unit	size				
Dimension/Config	guration	002	003	004	005	007	010	015	020	025	030
Cabinet Dimer	nsion				Unit heig	ht and width	dimensions	, in. (mm)			
Height		20.47 (520)	22.44 (570)	22.44 (570)	28.35 (720)	28.35 (720)	32.48 (825)	39.37 (1000)	51.57 (1310)	51.57 (1310)	59.06 (1500)
Width		28.54 (725)	34.84 (885)	42.52 (1080)	42.52 (1080)	56.50 (1435)	63.00 (1600)	74.41 (1890)	75.00 (1905)	89.96 (2285)	89.96 (2285)
Configuration	on				Unit	length dime	ensions, in. (	mm)			
Cooling only or	Flat filter	47.83 (1215)	53.94 (1370)	59.45 (1510)	62.01 (1575)	70.08 (1780)	70.08 (1780)	70.87 (1800)	78.35 (1990)	88.54 (2250)	88.54 (2250)
cooling with reheat coils	Angular filter	58.27 (1480)	61.42 (1560)	66.54 (1690)	73.03 (1855)	81.50 (2070)	81.50 (2070)	81.50 (2070)	93.31 (2370)	103.54 (2630)	106.69 (2710)
Cooling with preheat	Flat filter	51.97 (1320)	58.27 (1480)	62.99 (1600)	66.73 (1695)	76.77 (1950)	76.77 (1950)	79.92 (2030)	87.40 (2220)	95.67 (2430)	95.67 (2430)
coils	Angular filter	62.40 (15.85)	65.55 (1665)	70.08 (1780)	77.76 (1975)	88.19 (2240)	88.19 (2240)	90.55 (2300)	102.36 (2600)	110.63 (2810)	95.67 (2430)
l la clina calu	Flat filter	39.96 (1015)	46.06 (1170)	51.57 (1310)	52.95 (1345)	61.02 (1550)	61.02 (1550)	69.69 (1770)	77.56 (1970)	88.19 (2240)	88.19 (2240)
Heating only	Angular filter	50.79 (1290)	53.54 (1360)	58.66 (1490)	63.98 (1625)	72.44 (1840)	72.44 (1840)	80.31 (2040)	92.52 (2320)	103.15 (2620)	105.91 (2690)
	Flat filter	39.96 (1015)	46.06 (1170)	51.57 (1310)	52.95 (1345)	61.02 (1550)	61.02 (1550)	69.69 (1770)	77.56 (1970)	88.19 (2240)	88.19 (2240)
Ventilation only	Angular filter	50.79 (1290)	53.54 (1360)	58.66 (1490)	63.98 (1625)	72.44 (1840)	72.44 (1840)	80.31 (2040)	92.52 (2320)	103.15 (2620)	105.91 (2690)
(Horizontal) Dise	charge			Opening	Dimension C	pening heig	ht and width	dimensions	s, in. (mm)		
Height		18.11 (460)	20.08 (510)	20.08 (510)	25.98 (660)	25.98 (660)	30.11 (765)	37.00 (940)	49.21 (1250)	49.21 (1250)	56.69 (2225)
Width		26.18 (665)	32.48 (825)	40.16 (1020)	40.16 (1020)	54.13 (1375)	60.63 (1540)	72.05 (1830)	72.64 (1845)	87.60 (2225)	87.60 (2225)

#### Table 19: Cabinet Dimensions—Horizontal Unit with Plenum Fan

# Figure 14: Horizontal Unit (with Plenum Fan) Dimensions Front View





Width

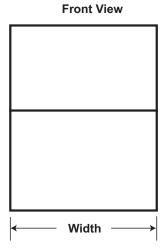
# **Cabinet Dimensions—Vertical**

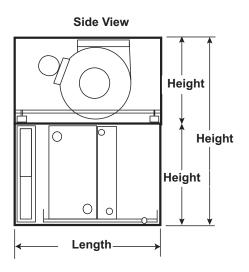
#### Table 20: Cabinet Dimensions—Vertical Unit

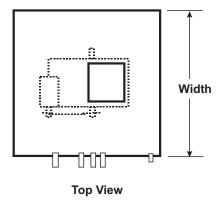
Width—in (mm) Length—in (mm) Upper section					Unit	size				
Dimensions	002	003	004	005	007	010	015	020	025	030
<b>Cabinet Dimension</b>				Unit height,	length, and w	idth dimensio	ons, in. (mm)			
Width—in (mm)	28.54 (725)	34.84 (885)	42.52 (1080)	42.52 (1080)	56.50 (1435)	62.99 (1600)	74.41 (1890)	75.00 (1905)	89.96 (2285)	89.96 (2285)
Length—in (mm)	29.92 (760)	33.07 (840)	33.07 (840)	36.42 (925)	39.96 (1015)	39.96 (1015)	42.72 (1085)	47.83 (1215)	51.18 (1300)	51.18 (1300)
Upper section height—in (mm)	17.13 (435)	19.88 (505)	19.88 (505)	22.05 (560)	24.61 (625)	24.61 (625)	23.82 (605)	26.97 (685)	31.30 (795)	31.30 (795)
Lower section height—in (mm)	20.47 (520)	22.44 (570)	22.44 (570)	28.35 (720)	28.35 (720)	32.48 (825)	39.37 (1000)	51.57 (1310)	51.57 (1310)	59.06 (1500)
Discharge Opening Dimensions				Unit hei	ght and width	dimensions,	in. (mm)			
Height—in (mm)	9.17 (233)	11.77 (299)	11.77 (299)	13.07 (332)	15.51 (394)	15.51 (394)	13.07* (332)	15.51* (394)	18.54* (471)	18.54* (471)
Width—in (mm)	8.74 (222)	10.20 (259)	10.20 (259)	11.34 (288)	13.46 (342)	13.46 (342)	11.34 (288)	13.46 (342)	15.83 (402)	15.83 (402)
Noto: * Twin openings										

Note: \* Twin openings

#### Figure 15: Vertical Unit Dimensions





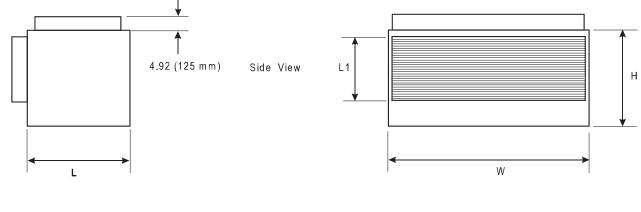


# **Mixing Box Dimensions**

#### Table 21: Mixing Box Dimensions—Horizontal and Vertical Units

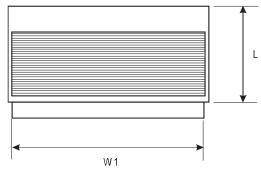
Unitaine		Cabinet, in. (mm)			Damper, in. (mm)	
Unit size	W	н	L	W1	L1	Area (ft <sup>2</sup> )
002	28.54 (725)	20.47 (520)	10.24 (260)	26.18 (665)	7.87 (200)	1.43
003	34.84 (885)	22.44 (570)	10.24 (260)	32.48 (825)	7.87 (200)	1.78
004	42.52 (1080)	22.44 (570)	10.24 (260)	40.16 (1020)	7.87 (200)	2.20
005	42.52 (1080)	28.35 (720)	14.17 (360)	40.16 (1020)	11.81 (300)	3.29
007	56.50 (1435)	28.35 (720)	14.17 (360)	54.13 (1375)	11.81 (300)	4.44
010	62.99 (1600)	32.48 (825)	14.17 (360)	60.63 (1540)	11.81 (300)	4.97
015	74.41 (1890)	39.37 (1000)	18.11 (460)	72.05 (1830)	15.75 (400)	7.88
020	75.00 (1905)	51.57 (1310)	25.98 (660)	72.64 (1845)	23.62 (600)	11.92
025	89.96 (2285)	51.57 (1310)	25.98 (660)	87.60 (2225)	23.62 (600)	14.37
030	89.96 (2285)	59.06 (1500)	29.92 (760)	87.60 (2225)	27.56 (700)	16.76





Front View





# Electric Heat Dimensions—Left/Right Oriented

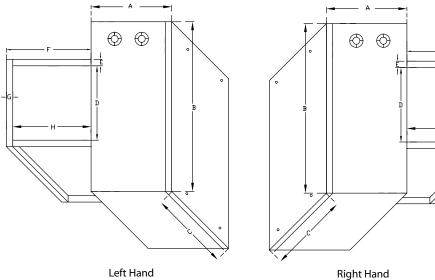
Dimension, in. (mm)	Unit Size												
	002			00	03		004						
	1 Step	2 Steps	1 Step	2 Steps	3 Steps	4 Steps	1Step	2 Steps	3 Steps	4 Steps			
А	9-1/2	9-1/2	9-1/2	9-1/2	9-1/2	9-1/2	9-1/2	9-1/2	9-1/2	9-1/2			
	(241)	(241)	(241)	(241)	(241)	(241)	(241)	(241)	(241)	(241)			
В	20	20	22-1/4	22-1/4	22-1/4	22-1/4	22-1/4	22-1/4	22-1/4	22-1/4			
	(508)	(508)	(565)	(565)	(565)	(565)	(565)	(565)	(565)	(565)			
С	11-1/2	16	11-1/2	16	20	24	11-1/2	16	20	24			
	(292)	(406)	(292)	(406)	(508)	(610)	(292)	(406)	(508)	(610)			
D	8-3/4	8-3/4	10-3/8	10-3/8	10-3/8	10-3/8	10-3/8	10-3/8	10-3/8	10-3/8			
	(222)	(222)	(264)	(264)	(264)	(264)	(264)	(264)	(264)	(264)			
E	3/4	3/4	3/4	3/4	3/4	3/4	3/4	3/4	3/4	3/4			
	(19)	(19)	(19)	(19)	(19)	(19)	(19)	(19)	(19)	(19)			
F	10	10	12-3/4	12-3/4	12-3/4	12-3/4	12-3/4	12-3/4	12-3/4	12-3/4			
	(254)	(254)	(324)	(324)	(324)	(324)	(324)	(324)	(324)	(324)			
G	3/4	3/4	3/4	3/4	3/4	3/4	3/4	3/4	3/4	3/4			
	(19)	(19)	(19)	(19)	(19)	(19)	(19)	(19)	(19)	(19)			
н	9-1/4	9-1/4	12	12	12	12	12	12	12	12			
	(235)	(235)	(305)	(305)	(305)	(305)	(305)	(305)	(305)	(305)			

#### Table 22: Electric Heat Dimensions - in. (mm), Sizes 002 through 004

#### Table 23: Electric Heat Dimensions - in. (mm), Sizes 005 through 010

Dimension, in. (mm)	Unit Size												
	005				007				010				
	1 Step	2 Steps	3 Steps	4 Steps	1 Step	2 Steps	3 Steps	4 Steps	1 Step	2 Steps	3 Steps	4 Steps	
A	9-1/2	9-1/2	9-1/2	9-1/2	9-1/2	9-1/2	9-1/2	9-1/2	9-1/2	9-1/2	9-1/2	9-1/2	
	(241)	(241)	(241)	(241)	(241)	(241)	(241)	(241)	(241)	(241)	(241)	(241)	
В	23-1/2	23-1/2	23-1/2	23-1/2	25	25	25	25	25	25	25	25	
	(597)	(597)	(597)	(597)	(635)	(635)	(635)	(635)	(635)	(635)	(635)	(635)	
С	11-1/2	16	20	24	11-1/2	16	20	24	11-1/2	16	20	24	
	(292)	(406)	(508)	(610)	(292)	(406)	(508)	(610)	(292)	(406)	(508)	(610)	
D	11-3/8	11-3/8	11-3/8	11-3/8	13-1/2	13-1/2	13-1/2	13-1/2	13-1/2	13-1/2	13-1/2	13-1/2	
	(289)	(289)	(289)	(289)	(343)	(343)	(343)	(343)	(343)	(343)	(343)	(343)	
E	3/4	3/4	3/4	3/4	3/4	3/4	3/4	3/4	3/4	3/4	3/4	3/4	
	(19)	(19)	(19)	(19)	(19)	(19)	(19)	(19)	(19)	(19)	(19)	(19)	
F	14	14	14	14	16-1/2	16-1/2	16-1/2	16-1/2	16-1/2	16-1/2	16-1/2	16-1/2	
	(356)	(356)	(356)	(356)	(419)	(419)	(419)	(419)	(419)	(419)	(419)	(419)	
G	3/4	3/4	3/4	3/4	3/4	3/4	3/4	3/4	3/4	3/4	3/4	3/4	
	(19)	(19)	(19)	(19)	(19)	(19)	(19)	(19)	(19)	(19)	(19)	(19)	
Н	13-1/4	13-1/4	13-1/4	13-1/4	15-3/4	15-3/4	15-3/4	15-3/4	15-3/4	15-3/4	15-3/4	15-3/4	
	(337)	(337)	(337)	(337)	(400)	(400)	(400)	(400)	(400)	(400)	(400)	(400)	

#### Figure 17: Electric Heat Dimensions



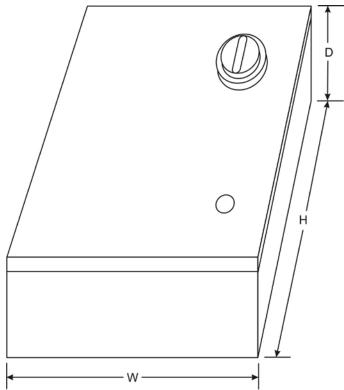
NOTE: Heaters are not intended to be installed with less than 20" of straight duct at the outlet of the heater.

# **Control Box Dimensions**

#### Table 24: Control Box Dimensions – Left and Right Hand Access

Dimension/Configuration	Unit size										
Dimension/Configuration	002	003	004	005	007	010	015	020	025	030	
Disconnect/Starter/Transformer	Dimensions, in. (mm)										
Width	8 (203)	8 (203)	8 (203)	8 (203)	8 (203)	8 (203)	12 (305)	12 (305)	12 (305)	12 (305)	
Depth	6 (152)	6 (152)	6 (152)	6 (152)	6 (152)	6 (152)	6 (152)	6 (152)	6 (152)	6 (152)	
Height	18 (407)	18 (407)	18 (407)	18 (407)	18 (407)	18 (407)	16 (415)	16 (415)	16 (415)	16 (415)	
Disconnect Only/ Left Hand Access Only					Dimension	is, in. (mm)					
Width	7 (178)	7 (178)	7 (178)	7 (178)	7 (178)	9 (223)	9 (223)	9 (223)	9 (223)	9 (223)	
Depth	5 (125)	5 (125)	5 (125)	5 (125)	5 (125)	6.5 (162)	6.5 (162)	6.5 (162)	6.5 (162)	6.5 (162)	
Height	15 (378)	15 (378)	15 (378)	15 (378)	15 (378)	17.5 (444)	17.5 (444)	17.5 (444)	21.3 (540)	21.3 (540)	

#### Figure 18: Control Box Dimensions





### Part 1: General

#### 1.01 Section Includes

A. Air handling units.

#### 1.02 References

- A. AFBMA 9—Load Ratings and Fatigue Life for Ball Bearings
- B. AMCA 99—Standards Handbook
- C. AMCA 210—Laboratory Methods of Testing Fans for Rating Purposes
- D. AMCA 300—Test Code for Sound Rating Air Moving Devices
- E. AMCA 500—Test Methods for Louver, Dampers, and Shutters
- F. AHRI 430—Central-Station Air-Handling Units.
- G. AHRI 435—Application of Central-Station Air-Handling Units
- H. ASTMB117—Standard Practice for Operating Salt Spray Apparatus
- I. NEMA MG1—Motors and Generators
- J. NFPA 70-National Electrical Code
- K. SMACNA—HVAC Duct Construction Standards -Metal and Flexible
- L. UL 723—Test for Surface Burning Characteristics of Building Materials
- M. UL 900—Test Performance of Air Filter Units
- N. UL 1995—Standard for Heating and Cooling Equipment
- O. UL 94—Test for Flammability of Plastic Materials for Parts in Devices and Appliances

#### 1.03 Submittals

- A. Shop Drawings: Indicate assembly, unit dimensions, weight loading, required clearances, construction details, field connection details, and electrical characteristics and connection requirements. Computer generated fan curves for each air handling unit shall be submitted with specific design operating point noted. A computer generated psychometric chart shall be submitted for each cooling coil with design points and final operating point clearly noted.
- B. Product Data:
  - 1. Provide literature that indicates dimensions, weights, capacities, ratings, fan performance, finishes of materials, and electrical characteristics and connection requirements.
  - 2. Provide data of filter media, filter performance data, filter assembly, and filter frames.
  - 3. Manufacturer's Installation Instructions.

#### 1.04 Operation and Maintenance Data

A. Maintenance Data: Include instructions for lubrication, filter replacement and motor and drive replacement.

#### 1.05 Qualifications

A. Manufacturer: Company specializing in manufacturing the Products specified in this section with minimum five years documented experience, which issues complete catalog data on total product.

#### 1.06 Delivery, Storage, and Handling

- A. Deliver, store, protect and handle products to site.
- B. Accept products on site on factory-installed shipping skids. Inspect for damage.
- C. Store in clean dry place and protect from weather and construction traffic. Handle carefully to avoid damage to components, enclosures, and finish.

#### 1.07 Environmental Requirements

A. Do not operate units for any purpose, temporary or permanent, until ductwork is clean, filters are in place, bearings lubricated, and fan has been test run under observation.

### Part 2: Products

#### 2.01 Manufacturers

- A. The following manufacturers are approved for use. No substitutions will be permitted.
  - 1. Daikin "Destiny" Air Handler is the basis of design, including standard product features and all special features required per plans and specifications.
  - 2. ETI
  - 3. Greenheck

#### 2.02 Air Handler Type And Arrangement

A. The air handler shall be furnished as a horizontal [vertical] ventilation [draw-through cooling coil only] [heating only] [draw-through cooling coil and heating coils in reheat position] [draw-through cooling coil and heating coils in preheat position] type.



#### 2.03 Air Handler Casing

- A. Unit shall have corrosion resistant casing design consisting of an aluminum frame with 1" thick, double wall panels. Extruded aluminum frame and polymeric corners pieces are required for casing protection and rigidity. Unit panels shall consist of injected polyurethane insulation sandwiched between galvanized steel [Galvalume Steel] exterior and interior sheets. Panels shall be fastened to frame with perimeter screws that hold panels in place with a closed cell neoprene gasket in-between the panel and the frame to prevent thermal bridging from the interior to the exterior of the unit.
  - 1. Removable panels on both sides of unit shall provide full access to unit interior. [In addition, removable panel shall be furnished in the bottom of filter section. Bottom filter frame shall be equipped with a clip to prevent filter media from falling when the panel is removed.] Filter and blower access panels shall include flush-mounted handle to assist in removing panels.
  - 2. [Opt.] Hinged and guarter-turn latched access doors to fan and filter sections on drive side [opposite drive side] [both sides of air handler]. Blower panel shall be furnished with two quarterturn open-to-close, latch assemblies, one with tooled flathead screw type operation and one with lever handle operation. Plenum fan units use three guarter-turn latch assemblies, one with tooled flathead screw type operation and two with lever handle operation. Access doors shall have the same construction as air handler panels. [Hinged and latched bottom access filter panel shall be furnished with two guarter-turn open-to-close, latch assemblies in the bottom of the filter section. Bottom filter frame shall be equipped with a clip to prevent filter media from falling when the panel is open. Side filter section panels shell be removable on both sides of the unit and include pocket pull handle to assist in panel removal]

#### 2.04 Supply Fan

- A. The supply fan shall be a DWDI forward-curved type. Fan assemblies including fan, motor and sheaves shall be dynamically balanced by the manufacturer on all three planes and at all bearing supports. Manufacturer must ensure maximum fan RPM is below the first critical speed [SWSI backward inclined plenum].
- B. Fan and motor assembly shall be mounted on vibration type isolators inside cabinetry.
- C. Units shall be certified in accordance with the central station air handling units certification program, which is based on AHRI Standard 430.

#### 2.05 Bearings and Drives

NOTE: Not applicable for direct drive plenum units.

- A. Bearings: Basic load rating computed in accordance with AFBMA - ANSI Standards, L-50 life at 200,000 hours heavy duty pillow block type, self-aligning, grease-lubricated ball bearings.
- B. Shafts shall be solid, hot rolled steel, ground and polished, keyed to shaft, and protectively coated with lubricating oil. Hollow shafts are not acceptable.
- C. V-Belt drives shall be cast iron or steel sheaves, dynamically balanced, bored to fit shafts and keyed. Variable and adjustable pitch sheaves selected, so required RPM is obtained with sheaves set at mid-position and rated based on motor horsepower. Contractor to furnish fixed sheaves at final RPM as determined by balancing contractor.

#### 2.06 Electrical

- A. Motor shall be a Premium Efficiency ODP [TEFC] type and must meet EISA minimum efficiency standards (applicable only to 1 HP motors and larger). Electrical characteristics shall be as shown in schedule.
- B. Air handler power connections and any control devices shall be field provided
- C. [Opt.] A junction box shall be furnished and mounted by manufacturer for field power connection to motor.
- D. [Opt.] Manufacturer shall furnish and mount a nonfused [fused] disconnect switch [with rotary handle and motor starter].
- E. [Opt.] A variable frequency drive with junction box [fused disconnect switch] shall be furnished and mounted by air handler manufacturer for field power connection.

#### 2.07 Cooling and Heating Sections

- A. Access to coils from drive side [opposite connection side] of unit for service and cleaning shall be provided. Coil headers and return bends shall be fully enclosed within unit casing. Coil connections shall be factory sealed with grommet on exterior and gasket sleeve between outer wall and inner liner where each pipe extends through the unit casing to minimize air and condensate leakage.
- B. Cooling Coils:
  - 1. Cooling performance shall be as specified on the unit schedule
  - Water coil fins shall have full drawn collars to provide a continuous surface cover over the entire tube for maximum heat transfer. Tubes shall be mechanically expanded into the fins to provide a continuous primaryto-secondary compression bond over the entire finned length for maximum heat transfer rates. Bare copper tubes shall not be visible between fins.



- 3. Coil tubes shall be seamless copper, expanded into fins, brazed at joints.
- 4. Water coils shall be provided with headers of seamless copper tubing with intruded tube holes to permit expansion and contraction without creating undue stress or strain. Coil connections shall be carbon steel or copper with connection size to be determined by manufacturer based upon the most efficient coil circuiting. Vent connections shall be provided at the highest point to assure proper venting. Drain connections shall be provided at the lowest point for proper drainage.
- Coils shall be tested with 320 pounds air pressure and suitable for 250 psig working pressure.
- 6. Coil casings shall be a formed channel frame of galvanized steel [stainless steel].
- C. Refrigerant Coils:
  - Coils designed for use with Refrigerant [R-22] [R-134a] [R-407C] [R-410A] as specified on the unit schedule. Fins shall have a minimum thickness of 0.006 inches aluminum with full drawn collars to provide a continuous surface cover over the entire tube for maximum heat transfer. Tubes shall be mechanically expanded into the fins to provide a continuous primarytosecondary compression bond over the entire finned length for maximum heat transfer rates. Bare copper tube shall not be visible between fins. Coil casings shall be a formed channel frame of galvanized steel [stainless steel].
  - Refrigerant coil suction connections shall be constructed of copper sweat type and shall be located at the bottom of the suction headers for gravity oil drainage. Pressure type liquid distributors shall be furnished. Coils shall be tested with 315 pounds air pressure, and suitable for 250 psig working pressure.
- D. Drain pan shall be constructed from antibacterial coated galvanized steel [stainless steel] with sloping pitch to drain connection to allow for condensate drainage. Drain Pan is positioned above 1" thick insulated double wall panel. Condensate drain connections shall be provided on both sides of drain pan. Secondary drain connections shall extend to cabinet exterior to comply with International Building Code and International Mechanical Code.

E. Electric heating coils shall be factory installed ETL listed open wire resistance heaters with single point power connection for the unit and heater. Heating coils shall be constructed of high nickel-chromium alloy resistance wire (80% Ni/20% Cr). Heaters shall have primary and secondary protection circuits, airflow switch, 24v control transformer, and disconnect switch. Contactors and fuses shall be provided for each heating stage with [1] [2] [3] [4] stage(s). Heaters shall be dielectrically tested for 1000V + twice the rated voltage, or 2000V (whichever is higher). The resistance heater shall be within 5% of rated value. Heating performance shall be as specified on the unit schedule. [Viconics R820 Series SCR power controller shall be included in the first heater stage.]

#### 2.08 Filters

- A. Filter section shall be a 2" [4"] flat [angle] type furnished with MERV 8 [MERV 11] [MERV 14] [MERV 15].deep pleated panel filters.
- B. Filter media shall be UL 900 listed, Class I or Class II.

#### 2.09 Mixing Box

- A. [Opt.] Mixing Box shall be constructed as described in section titled Air Handler Casing. The mixing box return and outside air openings shall be located as specified on plans and schedule.
  - Damper blades shall not be furnished on the outside [fresh] air damper. [The outside {fresh} air mixing box dampers shall be constructed of airfoil design extruded aluminum blades and aluminum frame.]
  - Damper actuator(s) shall be field mounted. [An outside {fresh} air damper actuator shall be factory mounted.]

## Part 3: Execution

#### 3.01 Installation

A. Install in accordance with manufacturer's instructions.



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